EXPT: 2 TCP CLIENT-SERVER COMMUNICATION USING SOCKET PROGRAMMING IN PYTHON

Aim:

To study and implement socket programming in Python for establishing communication between a client and a server using the TCP/IP protocol.

Introduction:

Socket programming is a method used for communication between two programs running on a network.

It allows a client and a server to send and receive data through network connections.

Python provides a built-in module called socket that supports both TCP (Transmission Control Protocol) and UDP (User Datagram Protocol) communication.

Algorithm:

Server:

1. Import the socket module.

2. Create a socket object using socket.socket().

3. Bind the socket to a host address and port using bind().

4. Listen for incoming connections using listen().

5. Accept a connection using accept().

6. Receive data from the client using recv().

7. Send a response to the client using send().

8. Close the connection using close().

Client:

1. Import the socket module.

2. Create a socket object using socket.socket().

3. Connect to the server using connect((host, port)).

4. Send data to the server using send().

5. Receive a response from the server using recv().

6. Close the connection using close().

Code:

SERVER:

```
import socket

sockfd=socket.socket(socket.AF_INET, socket.SOCK_STREAM)

print('Socket Created')

sockfd.bind(('localhost',55555))

sockfd.listen(3)

print('Waiting for connections')

while True:

    clientfd,addr=sockfd.accept()

    receivedMsg=clientfd.recv(1024).decode()

    print("Connected with ",addr)

    print("Message Received from Client: ",receivedMsg)

    clientfd.send(bytes(receivedMsg,'utf-8'))

    print("Message reply sent to Client!")

    print("Do you want to continue(type y or n):")

    choice=input()

    if choice=='n':

        break
```

CLIENT:

```
import socket

clientfd=socket.socket(socket.AF_INET, socket.SOCK_STREAM)

clientfd.connect(('localhost',55555))

name=input("Enter your message:")

clientfd.send(bytes(name,'utf-8'))
```
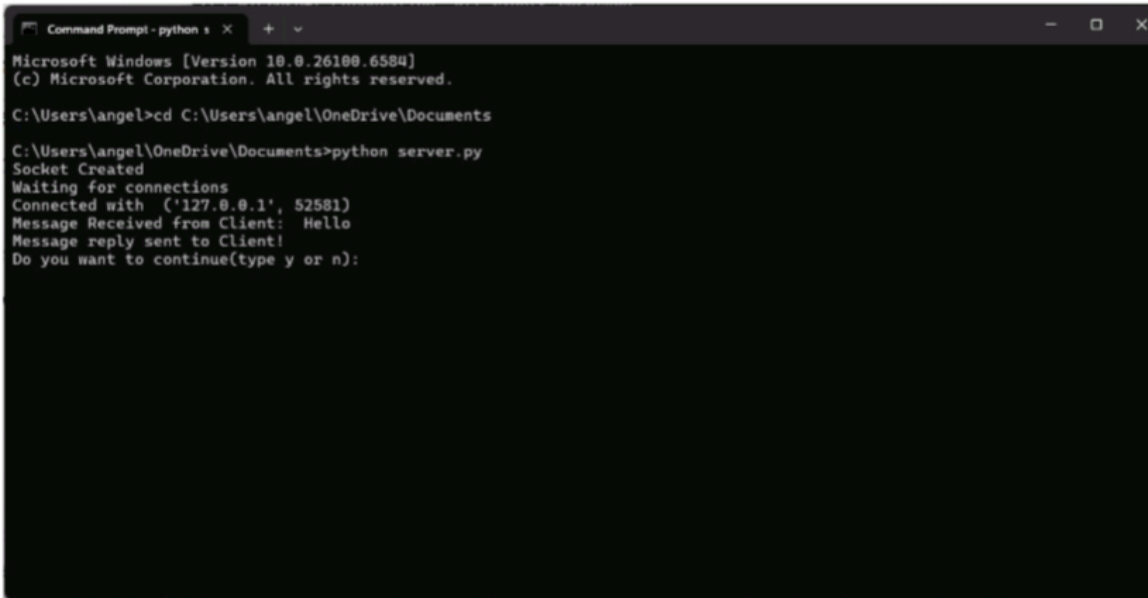
```
print("Message Received from Server: ",clientfd.recv(1024).decode())
```
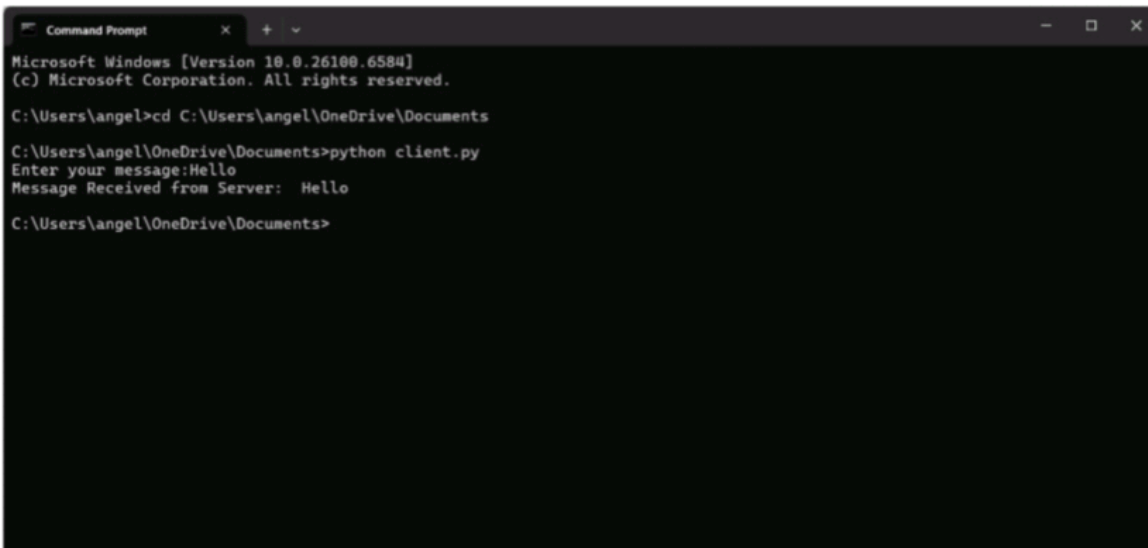
Output: *Server.*

```
Command Prompt - python s   X   +  v                                    —  □  ×
Microsoft Windows [Version 10.0.26100.6584]
(c) Microsoft Corporation. All rights reserved.

C:\Users\angel>cd C:\Users\angel\OneDrive\Documents

C:\Users\angel\OneDrive\Documents>python server.py
Socket Created
Waiting for connections
Connected with  ('127.0.0.1', 52581)
Message Received from Client:   Hello
Message reply sent to Client!
Do you want to continue(type y or n):
```

Client:

```
Command Prompt           X   +  v                                       —  □  ×
Microsoft Windows [Version 10.0.26100.6584]
(c) Microsoft Corporation. All rights reserved.

C:\Users\angel>cd C:\Users\angel\OneDrive\Documents

C:\Users\angel\OneDrive\Documents>python client.py
Enter your message:Hello
Message Received from Server:   Hello

C:\Users\angel\OneDrive\Documents>
```

Result:

The implementation of socket programming in Python was successfully executed. A TCP
connection was established between the client and the server, enabling successful
message   exchange.